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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/693,962 | 10/28/2003 | Chang-Fu Kuo | BHT-3212-45 | 4572 |

7590 02/27/2006

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| EXAMINER |
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VUONG, QUOCHIE B

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| ART UNIT | PAPER NUMBER |
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2685

DATE MAILED: 02/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|-----------------------------------|--|
| Office Action Summary | Application No. 10/693,962 | Applicant(s) KUO ET AL. | |
| | Examiner Quochien B. Vuong | Art Unit 2685 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-9 and 11-16 is/are rejected.
- 7) ☒ Claim(s) 2 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>10/28/03</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 10/28/2003 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

3. Claim 11 is objected to because of the following informalities: claim must end with a period (.) not a comma (,).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 3-6 and 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 3-6 recite the limitation "**the** second programmable divisor in **the** second programmable divider" in claim 3, line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 5 recites the limitation "the third filter" in claim 5, line 3. There is insufficient antecedent basis for this limitation in the claim.

Claims 11 and 12 recite the limitation "**the** second programmable divisor" in claim 11, line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 13 recites the limitation "**the** second programmable divisor of **the** second programmable divider" in claim 13, lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

In addition, claim 13 is indefinite because "the second programmable divider" does not have any function and is not recited in claim 9. Claim 13 should depend on claim 11 instead of claim 9.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1, 3, 7-9, 11, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montalvo et al. (US 6,693,969) in view of Khan (US 6,483,388).

Regarding claims 1 and 9, Montalvo et al. disclose a phase lock loop (figure 1) for receiving a baseband signal having an input frequency and modulating the baseband signal to be a corresponding RF signal having a predetermined transmission frequency for transmitting and the method for generating RF signal by utilizing the phase lock loop, the phase lock loop comprising: a frequency synthesizer (40) for generating a local oscillating signal having a local oscillating frequency; a first programmable divider (92) for dividing the frequency of the local oscillating signal by a first programmable divisor to generate a reference signal; a modulator (24) for modulating the frequency of the reference signal according to the baseband signal to generate a corresponding first comparison signal; a phase detector (32) for detecting phases of the first comparison signal and a second comparison signal, and outputting a corresponding current-controlled I/O signal in responsive to the phase difference of two comparison signals; a loop filter (34) for filtering the control current to output a control voltage; a voltage-controlled oscillator (VCO) (28) for generating the corresponding RF signal for transmitting according to the control voltage, the RF signal being fed back as

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a feedback signal; and a frequency converter (84) for receiving the feedback signal and the local oscillating signal to output the second comparison signal to the phase detector in responsive to the frequency difference of the feedback signal and the local oscillating signal; wherein the first programmable divisor of the first programmable divider is programmable-controlled so as to prevent, except the predetermined transmission frequency, occurrence of a spur frequency in the RF signal due to the interfered local oscillating signal (column 2, line 58 – column 5, line 40). Montalvo et al. do not specifically disclose a charging pump for receiving the current-controlled I/O signal and accordingly outputting a corresponding control current. However, it is well known in the art for a phase lock loop to comprise a charging pump between the phase detector and loop filter as taught by Khan (figure 4; column 4, lines 5-19). Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adapt the charging pump of Khan to the phase lock loop of Montalvo et al. for generating charge/discharge control signal to the loop filter.

Regarding claims 3 and 11, Montalvo et al. and Khan disclose the phase lock loop and method of claims 1 and 9 above; in addition, Montalvo et al. disclose a plurality of other frequency dividers (figure 1, items 82 and 90). Therefore, it would have been obvious to put one of other frequency dividers as a second programmable divider for dividing the local oscillating signal before entering the frequency converter as an alternative circuit configuration with the same result.

Regarding claims 7 and 14, Montalvo et al. and Khan disclose the phase lock loop and method of claims 1 and 9 above; in addition, Montalvo et al. disclose wherein

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the phase lock loop is utilized in a RF signal transmission device of a wireless communication system (column 1, lines 14-25).

Regarding claims 8 and 15, Montalvo et al. and Khan disclose the phase lock loop and method of claims 1 and 9 above; in addition, Montalvo et al. disclose wherein the phase lock loop merely comprises the only frequency synthesizer (40) to generate the single local oscillating frequency of the local oscillating signal (figure 1).

Regarding claim 16, Montalvo et al. and Khan disclose the method of claim 9 above; in addition, Montalvo et al. disclose wherein at least one filter (97) is employed to filter the signals in the phase lock loop (column 5, lines 22-33).

Allowable Subject Matter

9. Claims 2 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 2 and 10, Montalvo et al. and Khan disclose the phase lock loop and method of claims 1 and 9 above. However, Montalvo et al. and Khan fail to disclose wherein the phase lock loop and method further comprises a phase shift generator for shifting the phase of the reference signal of the first programmable divider by 90 degrees, and then inputting the phase-shifted reference signal into the modulator.

10. Claims 4-6, 12, and 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Regarding claims 4 and 12, Montalvo et al. and Khan disclose the phase lock loop and method of claims 3 and 11 above. However, Montalvo et al. and Khan fail to disclose wherein the phase lock loop and method further comprises a phase shift generator for shifting the phase of the reference signal of the first programmable divider by 90 degrees, and then inputting the phase-shifted reference signal into the modulator

Regarding claim 6 and 13, Montalvo et al. and Khan disclose the phase lock loop and method of claims 3 and 11 above. However, Montalvo et al. and Khan fail to disclose wherein the transmission frequency of the RF signal is F_{tx} , the local oscillating frequency of the local oscillating signal is F_{LO} , the first programmable divisor of the first programmable divider is M, the second programmable divisor of the second programmable divider is N, and F_{tx} , F_{LO} , M, and N satisfy the following equation: $F_{tx} = [(M \pm N)/(M \times N)] \times F_{LO}$.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Edwards (US 5,304,957) discloses low jitter phase locked loop for single phase applications.

Huff et al. (US 6,961,400) disclose automatic frequency correction apparatus and method of operation.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quochien B. Vuong whose telephone number is (571) 272-7902. The examiner can normally be reached on M-F 9:30-18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Quochien B. Vuong
Feb. 20, 2006.



QUOCHIE B. VUONG
PRIMARY EXAMINER